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**CLAIMS:**

1. Flat microwave antenna comprising of three stacked grounded metal plates with plurality of openings (apertures) and antenna feed layers, situated between the said plates, wherein said apertures are arranged as matrix of columns and rows, wherein the said excitation probes are aligned by pairs with said apertures, forming that way antenna radiating elements and a solid metal plate situated below the last one (bottom one) of the said grounded plates, which together with three-plate stack forms two separate antenna packages (Ap1) and (Ap2) containing two orthogonal polarizations, wherein said antenna packages include layer (8) with active devices assembled on it for an initial amplification of the received signal, which are connected with the groups of radiating elements (4D,5D,1A) through coaxial transitions (13) and a combining block (9), connected to the said active layer (8), wherein antenna layers (4,5) are arranged as subarrays and the antenna output is connected through transition (12) to a twin Low Noise Block (LNB)
2. Antenna of Claim 1, wherein between said grounded metal plates (1,2,3) and said antenna feed layers (4,5) are situated insulating layers (6) made by a low-loss dielectric material
3. Antenna of Claims 1 or 2, wherein said antenna layers (4, 5) are divided to sixteen subarrays, wherein each two of them are identical and form one quarter of the antenna

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4. Antenna of Claim 3, wherein the antenna layers of each neighbouring antenna quarters (4, 5) are rotated at 90° angle to the each other.
- 5 5. Antenna of Claim 1, wherein the central conductor of the strip line (4B, 5B) from the said antenna feed layers (4, 5) is made by a metal sheet with a thickness of 0.1 to 0.3 mm, processed using some of the known technologies for thin metal sheet etching, to form strip feed lines (4B, 5B)
- 10 6. Antenna of Claim 5, wherein the metal sheet forms supporting frames (4A, 5A) and elements for mechanical connection (4C).
- 15 7. Antenna of Claim 6, wherein the said elements for mechanical connection (4C) are accomplished as RF decoupling circuits.
- 20 8. Antenna of Claims 1 to 7, wherein the said radiating elements (1A) have an octagonal shape with two parallel long sides, two shorter parallel sides and four short sides, connecting each one of the corresponding ends of the long sides with the respective ends of each one of the shorter sides.
- 25 9. Antenna of Claim 1, wherein the upper metal plate with openings (1) is made by a metal sheet (100) with openings (100A), which is much more thicker than the rest of the metal plates (2,3) in the package.

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10. Antenna of Claim 1, wherein the said transition (12) is made  
by an asymmetric shaping of the two orthogonal microstrip  
strip probes situated in one plane (12A) in order to excite two  
orthogonal modes of electromagnetic fields with minimal level  
5 of cross talk between them in the cylindrical waveguide (14),  
wherein the transition between the said microstrip line and  
the said waveguide is accomplished by means of a short  
section of a grounded coplanar line (12B).